

PREDATOR REMOVAL STUDY

In 2003, Louisiana Department of Wildlife and Fisheries and Delta Waterfowl Foundation entered into a cooperative agreement to remove predators from duck nesting areas to evaluate the increase in ducks sent to Louisiana. Delta has agreed to provide trapping services on approximately 92,000 acres consisting of 4 tracts in North Dakota and measure nest success on trapped and non-trapped control areas.

Site Selection and Nest Monitoring Methodology

“Predator removal may be most effective where habitat management has attracted high duck densities but where nest success remains low due to abundant predators.” (Garrettson and Rohwer: Journal of Wildlife Management 65(3):398-405, 2001). Delta’s proposal indicated that a GIS generated Predator Management Decision Matrix (Figure 1) developed in conjunction with the U.S. Fish and Wildlife Service’s Habitat and Population Evaluation Team (HAPET) allows for “highly targeted placement of future trap sites” which were to be located within the Drift Prairie Region. R. Reynolds (HAPET member, pers. comm.) indicated that the best areas to target on this figure would be the dark blues because of the high nesting pairs but low nesting success.

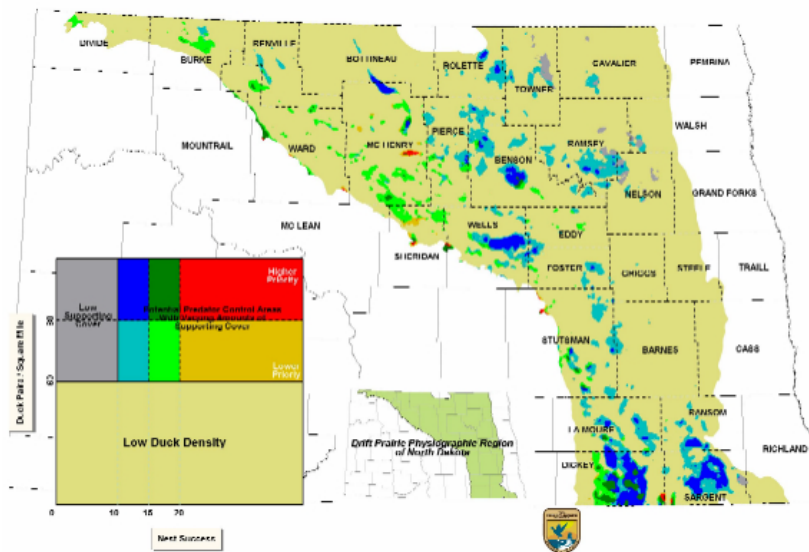


Figure 1. Predator Management Decision Matrix

He further indicated that these areas were of sufficient size to establish 6-mile x 6-mile treatment and control areas with buffers of 3 miles between the two sites with a suggestion that 5 miles is a better buffer size. The difference in the lighter blue areas from the darker blue are basically slightly lower nesting pairs (>60 instead of >80).

Predator removal and control sites are to be selected from counties with sufficient contiguous areas of dark blues and light blues to develop the 6-mile x 6-mile treatment,

and control sites at a minimum of 3 miles, and preferably at least 5 miles distal, that contain similar habitats. (Note: Control areas may be somewhat smaller than trapped areas.) Trapping operations (Fig. 2) in initial contract year will take place in Mountrail, Eddy, Towner, and Benson Counties, North Dakota. Future trapping sites may change, based upon mutual agreement between State and Contractor. It is likely that some sites will not be completely homogeneous relative to the Predator Management Decision Matrix. For example, some clusters may contain unequal amounts of dark blue and light blue or even some small areas of green imbedded within the larger, largely blue zone. Every effort must be made to make the treatment and control sites similar by centering the necessary area for the 3 types of areas (predator trapping, buffer, and control). The buffer area does not have to be the same as the other 2 types of sites. After selection of a suitable site, the control and trapped locations will be randomly determined and the State notified of each site's location. The State must approve any areas that do not meet these criteria. A daily trapping log that includes species caught must be provided bi-monthly.



Figure 2. An example of Delta's trap with scented plastic eggs

Nesting success will be monitored on both predator trapped and control areas. Nest searching will be distributed across each site. The low number of replications makes it imperative to find as many nests as possible. Garrettson and Rohwer (2001) located approximately 3,000 nests on a series of study sites of comparable size to this study. Based on the estimated costs of sampling trapped and control sites, it was decided that a stratified random sampling approach to nest searches be conducted using 3 teams of searchers. A stratified random sample shall then be conducted that will distribute samples across the study sites with emphasis on better nesting habitats to insure higher sample size. Nest searches shall be made beginning in late May and ending in late June. The Mayfield method will be used to determine nesting success by species, when sufficient data are available, and species pooled.

Pair count methodology

Pair numbers are a standard metric of duck abundance. Pair counts will be conducted on 14 plots on each of the 4 trapped and 4 control blocks within each study area. Each of the 14 pair count plots will be 80 acres (32.4 ha.) in area with dimensions of $\frac{1}{2}$ by $\frac{1}{4}$ mile (804 m x 402 m). That size allows pair counts to be conducted by one person without concern for rollup. A single observer will walk the edge of each pond or part of a wetland that is inside the plot and count all ducks that are inside the plot boundaries. Standard May breeding pair survey count methodology will be used. Lone males will be counted as pairs as will all males in groups of 5 or less (USFWS & CWS 1987, Brasher et al. 2002). Pair counts will begin in spring as soon as ice melts from all ponds and early arriving species (Mallards and Northern Pintails) have settled on the blocks. Pair counts will continue until the third week of May. It is anticipated that least two rounds of pair counts will be conduct.

The plots within each study block will be randomly selected from quarter sections (160 acres) whose farmable lands are predominantly grassed. Grassland plots will be those categorized as having grass in over 95% of the farmable acreage on each half of the quarter section. In the vast majority of cases that grass will be either a Waterfowl Production Area (WPA) managed by the United States Fish & Wildlife Service (USFWS) or it will be private land enrolled in the Conservation Reserve Program (CRP). Any plots that have a mix of grassland and cropland will be excluded from the selection process as will plots that include an active farmyard. Some landowners likely will not allow access to their property for pair counts or nest searching. The half (80 acres) of the quarter section that is to be sampled will be randomly assigned to either a North/South or East/West oriented plot depending on the access point. The survey order of blocks will be randomly determined, but plots within blocks will be surveyed in a manner that maximizes efficiency; i.e., in a way that minimizes travel time. If permission can not be obtained, another random selection will be made. If time permits, additional plots will be randomly selected and completely searched. These additional plots will be used for nest searching as well if the minimum of 75 nests per study block is not reached. Otherwise, the added pair count plots will not be used for the nest search portion of the study.

Nest Search Methods

Nest searches will be conducted on the same 80-acre plots that were randomly selected for pair counts. The order of blocks and plots within blocks to be counted will be randomly determined. If a minimum of 75 nests is not found after searching the 14 random plots, any additional plots that were randomly selected and added to the pair count portion of the study will be completely search in order of their selection until 75 or more nests are found. If the 75-nest minimum still is not reached, additional plots will be randomly selected as previously described and completely searched until the minimum is reached or exceeded.

Searches will be systematic, starting at the far side of a plot and proceeding toward the access point (nearest road). Passes will be parallel with the short side of the rectangular plot. Such short searches allow more complete coverage of all nesting habitat because searchers have short travel distances between turns. This also allows searchers to rapidly distance themselves from discovered nests, which is believed important in reducing abandonment of laying stage nests. Each 80-acre block can be searched in about 2-3 hours unless very large numbers of nests are discovered, which increases handling time (about 7 minutes per nest) and decreases the amount of area covered by a nest searching crew.

Nest searches will be conducted using two ATVs and a modified cable-chain drag (Klett et al. 1986). Unpublished Delta data suggest that a cable-chain drag flushes more females than a simple chain drag. ATV speed will be regulated by searching in 1st gear, which is a crude but effective way of regulating search speed if the same type of ATV is used for all nest searching.

An orange rod (3mm diameter, 0.95 m length) will be placed at each nest that is found and a numbered wooden lath will be placed 10 m away. UTM coordinates of each nest will be recorded for all nests. The nest will be covered at the end of the nest check on the day it is found and an X will be marked on the top of the nest material used to cover the eggs. The nest will be recorded as abandoned due to investigator disturbance if the X is in place at the subsequent nest visit. Surrounding vegetation will be used to create the X.

When nests are discovered, and at every subsequent nest check, the eggs will be field candle to determine stage of development (Weller 1956). Clutch size will be recorded and all eggs will be individually labeled upon nest discovery and at subsequent nest checks. Marking eggs allows for detection of partial predation even when nests are found during the laying stage. The length and width of each egg in the clutch will be measured using digital carbon-fiber calipers once the clutch is complete. Egg mass will be calculated using these linear measurements (Hoyt 1979). Nest initiation dates will be determined by backdating with the assumption that females lay one egg per day. Nests will be checked approximately weekly to determine nest fate.

Habitat Characteristics Determination

A measure of wetland abundance is essential because pair counts usually show a positive relationship with wetlands. On the first cloudless day after the 10th of May aerial

photographs of each quarter section that encompasses one of the pair-count/nest count plots will be made. A GIS data layer will then be made to determine upland area, upland edge, wetland area and shoreline edge. The latter is the likely metric that will be used to create pair number to wetland regressions that are need to correct for differences in wetland abundance, but other variables will be tested.

Density Dependency

Initial efforts will use only trapped sites. Once pilot work determines best metrics, use of only randomly selected trapped blocks will be used to determine validity.

Summary Reports

Documentation as provided for in Appendix 1 and Addendum 1 are to be provided. Additionally, success will be tested for wetland and grass abundance correlations. Because the Louisiana Department of Wildlife and Fisheries is not providing all of the funding for the research efforts, data collected does not become solely its property. However, the Department reserves the right to review or co-author all publications resulting from this work. Additionally, electronic copies of all data shall be provided to the Department.